

Title (en)
GUIDE RNAS AND USES THEREOF

Title (de)
GUIDE-RNAS UND VERWENDUNGEN DAVON

Title (fr)
ARN GUIDES ET LEURS UTILISATIONS

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Abstract (en)
The present invention is related to an isolated guide ribonucleic acid (gRNA) comprising a guide sequence targeting an inhibitory receptor (IR), a TCR α (TRAC) constant region or a β chain (TRBC1/2) constant region target sequence, wherein said guide sequence is selected from the group consisting of SEQ ID NOs: 1-27.

IPC 8 full level
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Citation (applicant)

- WO 2007017915 A2 20070215 - SAN RAFFAELE CENTRO FOND [IT], et al
- GATTINONI, NAT MED, 2011
- OLIVEIRA, STM, 2015
- GATTINONI, REVIEW IN NAT MED, 2017
- "NCBI", Database accession no. NC_000000.1.11
- "UniProtKB/Swiss-Prot", Database accession no. Q99ZW2
- HENDEL A ET AL., NAT BIOTECH, 2015
- TIJSSEN: "Laboratory Techniques In Biochemistry And Molecular Biology -Hybridization With Nucleic Acid Probes Part 1", 1993, ELSEVIER, article "Overview of principles of hybridization and the strategy of nucleic acid probe assay"
- NOVIELLO, MANFREDI ET AL., NAT. COMM., 2019
- TOFFALORI ET AL., NAT. MED, 2019
- CANALE ET AL., CANCER RES, 2018
- BLACKBURN SD SHIN HHAINING WNZOU TWORKMAN CJPOLLEY ABETTS MRFREEMAN GJVIGNALI DAAWHERRY EJ: "Coregulation of CD8+ T cell exhaustion by multiple inhibitory receptors during chronic viral infection", NAT. IMMUNOL., vol. 10, 2009, pages 29 - 37, XP055047746, DOI: 10.1038/ni.1679
- BUSCH DHFRABLE SPSOMMERMEYER DBUCHHOLZ VRRIDDELL SR: "Role of memory T cell subsets for adoptive immunotherapy", SEMIN. IMMUNOL., vol. 28, 2016, pages 28 - 34, XP029535362, Retrieved from the Internet <URL:http://dx.doi.org/10.1016/j.smim.2016.02.001> DOI: 10.1016/j.smim.2016.02.001
- CANALE FPRAMELLO MCNUNEZ NFURLAN CLABOSSIO SNSERRAN MGBOARI JTDEL CASTILLO ALEDESMA MSERDLIK C: "CD39 expression defines cell exhaustion in tumor-infiltrating CD8+ T cells", CANCER RES, 2018
- CIANCOTTI BCRUGGIERO ECAMPOCHIARO COLIVEIRA GMAGNANI ZIBALDINI MDOGLIO MTASSARA MMANFREDI AABALDISSERA E: "CD4 + memory stem T cells recognizing citrullinated epitopes are expanded in patients with Rheumatoid Arthritis and sensitive to TNF- α blockade", ARTHRITIS RHEUMATOL., 2019, Retrieved from the Internet <URL:https://onlinelibrary.wiley.com/doi/abs/10.1002/art.41157>
- CIERI NCAMISA BCOCCHIARELLA FFORCATO MOLIVEIRA GPROVASI EBONDANZA ABORDIGNON CPECCATORI JCICERI F, IL-7 AND IL-15 INSTRUCT THE GENERATION OF HUMAN MEMORY STEM T CELLS FROM NAIVE PRECURSORS, vol. 121, 2013, pages 573 - 585
- CIERI NOLIVEIRA GGRECO RFORCATO MTACCIOLI CCIANCOTTI BVALTOLINA VNOVIELLO MVAGO LBONDANZA A: "Generation of human memory stem T cells after haploidentical T-replete hematopoietic stem cell transplantation", BLOOD, vol. 125, 2015, pages 2865 - 2874
- CLAY TMCUSTER MCSACHS JHWU PROSENBERG SANISHIMURA MI: "Efficient transfer of a tumor antigen-reactive TCR to human peripheral blood lymphocytes confers anti-tumor reactivity", J. IMMUNOL., vol. 163, 1999, pages 507 - 13, Retrieved from the Internet <URL:http://www.ncbi.nlm.nih.gov/pubmed/10384155>
- FOURCADE JSUN ZBENALLAOUA MGUILLAUME PLUESCHER IFSANDER CKIRKWOOD JMKUCHROO VZAROUR HM: "Upregulation of Tim-3 and PD-1 expression is associated with tumor antigen-specific CD8+ T cell dysfunction in melanoma patients", J. EXP. MED., vol. 207, 2010, pages 2175 - 2186
- FUERTES MARRACO SASONESON CCAGNON LGANNON POALLARD MMAILLARD SAMONTANDON NRUFER NWALDVOGEL SDELORENZI M: "Long-lasting stem cell-like memory CD8+ T cells with a naive-like profile upon yellow fever vaccination", SCI. TRANSL. MED., 2015, pages 7
- GATTINONI LLUGLI EJI YPOS ZPAULOS CMQUIGLEY MFALMEIDA JRGOSTICK EYU ZCARPENITO C: "A human memory T cell subset with stem cell-like properties", NAT. MED., vol. 17, 2011, pages 1290 - 1297, XP055551014, DOI: 10.1038/nm.2446
- GATTINONI LSPEISER DELICHTERFELD MBONINI C: "T memory stem cells in health and disease", NAT. MED., vol. 23, 2017, pages 18 - 27, XP055744455, DOI: 10.1038/nm.4241
- JIN HTANDERSON ACTAN GWEST EEHA SJARAKI KFREEMAN GJKUCHROO VKAHMED R: "Cooperation of Tim-3 and PD-1 in CD8 T-cell exhaustion during chronic viral infection", PROC. NATL. ACAD. SCI. U. S. A., vol. 107, 2010, pages 14733 - 14738, XP055254340, DOI: 10.1073/pnas.1009731107
- KASSU AMARCUS RAD'SOUZA MBKELLY-MCKNIGHT EAGOLDEN-MASON LAKKINA RFONTENOT APWILSON CCPALMER BE: "Regulation of Virus-Specific CD4 + T Cell Function by Multiple Costimulatory Receptors during Chronic HIV Infection", J. IMMUNOL., vol. 185, 2010, pages 3007 - 3018
- KAUFMANN DEKAVANAGH DGPEREYRA FZAUNDERS JJMACKEY EWMUURA TPALMER SBROCKMAN MRATHOD APIECHOCKA-TROCHA A: "Upregulation of CTLA-4 by HIV-specific CD4+ T cells correlates with disease progression and defines a reversible immune dysfunction", NAT. IMMUNOL., vol. 8, 2007, pages 1246 - 1254, XP055050050, DOI: 10.1038/ni1515
- KNIGHT SCXIE LDENG WGUGLIELMI BWITKOWSKY LBBOSANAC LZHANG ETBEHEIRY MEMASSON JBDAHAN M: "Dynamics of CRISPR-Cas9 genome interrogation in living cells", SCIENCE (80-.), vol. 350, 2015, pages 823 - 826
- MARQUEZ-RODAS IMCARTHUR GAASCIERTO PALONG G V. ET AL.: "Combined nivolumab and ipilimumab or monotherapy in untreated Melanoma", N. ENGL. J. MED., vol. 373, 2015, pages 23 - 34, XP05553658, DOI: 10.1056/NEJMoa1504030

- LEACH DRKRUMMEL MFALLISON JP: "Enhancement of antitumor immunity by CTLA-4 blockade", SCIENCE (80-.), vol. 271, 1996, pages 1734 - 1736, XP000986211, DOI: 10.1126/science.271.5256.1734
- MANIATIS TFRITSCH EFSAMBROOK J: "Molecular Cloning: A Laboratory Manual", 1982, COLD SPRING HARBOR LABORATORY PRESS
- MASTAGLIO SGENOVESE PMAGNANI ZRUGGIERO ELANDONI ECAMISA BSCHIROLI GPROVASI ELOMBARDO AREIK A: "NY-ESO-1 TCR single edited stem and central memory T cells to treat multiple myeloma without graft-versus-host disease", BLOOD, vol. 130, 2017, pages 606 - 618, XP055594240, DOI: 10.1182/blood-2016-08-732636
- NAKAMOTO NCHO HSHAKED AOLTHOFF KVALIGA MEKAMINSKI MGOSTICK EPRICE DAFREEMAN GJWHERRY EJ: "Synergistic reversal of intrahepatic HCV-specific CD8 T cell exhaustion by combined PD-1/CTLA-4 blockade", PLOSPATHOG, 2009, pages 5
- NOVELLO MMANFREDI FRUGGIERO EPERINI TOLIVEIRA GCORTESI FDE SIMONE PTOFFALORI CGAMBACORTA VGRECO R: "Bone marrow central memory and memory stem T-cell exhaustion in AML patients relapsing after HSCT", NAT. COMMUN., vol. 10, 2019, pages 1 - 15
- OLIVEIRA GRUGGIERO ESTANGHELLINI MTLCIERI ND'AGOSTINO MFRONZA RLULAY CDIONISIO FMASTAGLIO SGRECO R: "Tracking genetically engineered lymphocytes long-term reveals the dynamics of t cell immunological memory", SCI. TRANSL. MED., vol. 7, 2015, pages 1 - 14
- PROVASI EGENOVESE PLOMBARDO AMAGNANI ZLIU PQREIK ACHU VPASCHON DEZHANG LKUBALL J: "Editing T cell specificity towards leukemia by zinc finger nucleases and lentiviral gene transfer", NAT. MED., vol. 18, 2012, pages 807 - 815, XP055181611, DOI: 10.1038/nm.2700
- ROBBINS PFKASSIM SHTRAN TLNCRYSTAL JSMORGAN RAFELDMAN SAYANG JCDUDLEY MEWUNDERLICH JRSHERRY RM: "A pilot trial using lymphocytes genetically engineered with an NY-ESO-1-reactive T-cell receptor: Long-term follow-up and correlates with response", CLIN. CANCER RES., vol. 21, 2015, pages 1019 - 1027, XP055212606, DOI: 10.1158/1078-0432.CCR-14-2708
- ROBERTO ACASTAGNA LZANON VBRAMANTI SCROCCHIOLO RMCLAREN JEGANDOLFI STENTORIO PSARINA BTIMOFEEVA I: "Role of naive-derived T memory stem cells in T-cell reconstitution following allogeneic transplantation", BLOOD, vol. 125, 2015, pages 2855 - 2864
- SAKUIISHI KAPETOH LSULLIVAN JMBLAZAR BRKUCHROO VKANDERSON AC: "Targeting Tim-3 and PD-1 pathways to reverse T cell exhaustion and restore anti-tumor immunity", J. EXP. MED., vol. 207, 2010, pages 2187 - 2194, XP055052551, DOI: 10.1084/jem.20100643
- TOFFALORI CZITO LGAMBACORTA VRIBA MOLIVEIRA GBUCCI GBARCELLA MSPINELLI OGRECO RCRUCITTI L: "Immune signature drives leukemia escape and relapse after hematopoietic cell transplantation", NAT. MED., vol. 25, 2019, pages 603 - 611, XP036749925, Retrieved from the Internet <URL:http://dx.doi.org/10.1038/s41591-019-0400-z> DOI: 10.1038/s41591-019-0400-z
- WHERRY EJKURACHI M: "Molecular and cellular insights into T cell exhaustion", NAT. REV. IMMUNOL., vol. 15, 2015, pages 486 - 499, XP055339794, DOI: 10.1038/nri3862
- WOLCHOK JDKLUGER HCALLAHAN MKPOSTOW MARIZVI NASEGAL NHARIYAN CEGORDON RAREED KBURKE MM: "Nivolumab plus Ipilimumab in advanced melanoma", N. ENGL. J. MED., vol. 369, 2013, pages 122 - 133, XP055182024, DOI: 10.1056/NEJMoa1302369
- ZHANG YZHANG XCHENG CMU WLIU XLI NWEI XLIU X, CRISPR-CAS9 MEDIATED LAG-3 DISRUPTION IN CAR-T CELLS, vol. 11, 2017, pages 554 - 562

Citation (search report)

- [XY] WO 2019118508 A1 20190620 - UNIV PENNSYLVANIA [US]
- [XY] CN 107760680 A 20180306 - BEIJING MICRO HELIX GENE TECH CO LTD
- [Y] EP 3650545 A1 20200513 - JIANGSU HENGRUI MEDICINE CO [CN], et al
- [X] WO 2017093969 A1 20170608 - NOVARTIS AG [CH], et al
- [X] WO 2019232477 A2 20191205 - UNIV WASHINGTON [US], et al
- [A] WO 2014191128 A1 20141204 - CELLECTIS [FR]
- [A] WO 2020113029 A2 20200604 - UNIV TEXAS [US]
- [AD] K. SAKUIISHI ET AL: "Targeting Tim-3 and PD-1 pathways to reverse T cell exhaustion and restore anti-tumor immunity", NATURE REVIEWS IMMUNOLOGY, vol. 6, no. 10, 27 September 2010 (2010-09-27), pages 2187 - 2194, XP055151727, ISSN: 1474-1733, DOI: 10.1084/jem.20100643
- [A] JIANGTAO REN ET AL: "A versatile system for rapid multiplex genome-edited CAR T cell generation", ONCOTARGET, vol. 8, no. 10, 9 February 2017 (2017-02-09), pages 17002 - 17011, XP055565031, DOI: 10.18632/oncotarget.15218
- [A] CHENGGONG LI ET AL: "Applications and explorations of CRISPR/Cas9 in CAR T-cell therapy", BRIEFINGS IN FUNCTIONAL GENOMICS, vol. 19, no. 3, 17 January 2020 (2020-01-17), pages 175 - 182, XP055706104, DOI: 10.1093/bfpg/elz042

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